Turning the Tide
on runoff pollution
SC DHEC's Bureau of Water

Summer, 2006

This project is a good example of how multiple public goals can be accomplished (handling stormwater and reducing flooding, building parks and roads) while protecting natural resources.

Inside...

TMDL Implementation Project 2
Reducing Car-Washing Impacts 3
EPA's National Pollution Management Measures 3
Marine Debris Initiative 4
Watershed Planning Handbook 4
We All Live Downstream 5

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

An Innovative System for Handling Stormwater On Hilton Head Island

By Sally Krebs, Town of Hilton Head Island

In 1995, severe flooding affected residential and commercial development upstream from an area that forms the headwaters of Jarvis Creek on Hilton Head Island. In order to prevent a recurrence of this flooding, the Town's consulting engineers suggested altering the forested and emergent wetlands that formed the headwaters of Jarvis Creek and were fed by this stormwater.

This area would be converted into a ditch 6 feet deep, 35 feet wide at the bottom and 100 feet wide at the top, lined with rip rap, that would efficiently convey the stormwater to its outfall at Jarvis Creek. This proposal would have destroyed 4 acres of freshwater wetlands and a large and unique upland habitat and degraded water quality in the creek.

Because of these concerns, several of the Town's staff redesigned the drainage project, merging it with an adjacent park project. With staff's new design, only 0.468 acres of freshwater wetlands were impacted to install a pump station. The station brings stormwater to a 13 acre lagoon that was dug on the adjacent park land in an area previously used to graze cattle.

The location of the lagoon minimized tree removal and the excavated dirt was sold to raise the money to design and build the park. Four 48 inch pipes were installed to carry stormwater from the pump station to the lagoon, and the park road was installed over the pipes to

more on page 6

13 acre lagoon with mitigated wetland and natural forested wetland.

Upstate TMDL Implementation Project Produces Water Quality Improvements

By Morris Warner, Clemson Extension & Meredith Barkley, SC DHEC

South Carolina's first 319-funded TMDL implementation project was completed in December 2005. This three-year project in the Coneross Creek and Beaverdam Creek watersheds was designed to implement a fecal coliform TMDL by working with homeowners and the agricultural community to install Best Management Practices (BMPs). The project was a partnership between Clemson University, USDA Natural Resources Conservation Service, Oconee County Soil and Water Conservation District and the Oconee County Cattlemen's Association.

Project partners provided community education, repaired 38 rural septic systems and installed 80 agricultural BMPs including planting buffers and field borders, fencing cattle from creeks and providing alternative water sources, and building compost facilities. The project is now showing measurable success.

SCDHEC monitors three sites within the two watersheds. Current data show that all three sites are now meeting water quality standards. The TMDL was written because these stations were placed on the 303(d) list as not meeting water quality standards. Now that water quality standards are being attained, the goals of the Clean Water Act under Section 303(d) have been met. Monitoring will continue at all three stations to ensure that standards are maintained.

Current data show that all three sites are now meeting water quality standards.

In addition to the obvious water quality benefits, the Coneross Creek/ Beaverdam Creek TMDL implementation project resulted in many other benefits to the participants. Agricultural producers have been pleased with the practices installed. In many cases, these practices have complemented the particular livestock operation and enabled them to move forward with their business plans.

Werner Christiansen, for example, participated in the project to fence his goats out of the creek. The benefit to his operation was the installation of additional cross-fencing that enables him to better manage the forage and increase the forage utilization on his farm.

The Hendrix Farm installed a number of practices designed to get cattle out of the creek and pond including fencing cattle out of the pond and installing a watering gap to limit access to the pond, fencing cattle out of the creek, and drilling a well and installing watering facilities for the cattle. Once the cattle had a fresh supply of water, they no longer went to the creek or pond to get water. The cattle grazing patterns are now distributed across the pasture rather than being concentrated closer to the creek or pond. She expects to see increased performance of the cattle from the increased grazing efficiency alone. Additionally, she is considering installing more tanks on her own to further distribute the grazing patterns.

The Swafford Farm has multiple livestock enterprises including cattle and poultry. A stream flows through the farm just behind the poultry houses, splitting the pastureland. The addition of a waste stacking shed provides a shelter to store the litter until weather permits the application of the litter to the land, reducing the fecal coliform loading to the stream. Additionally, the cattle were fenced out of the stream and a well and watering system were installed for the cattle, further reducing the fecal coliform loading of that stream. Prior to the installation of the well and watering system, the Swafford

more on page 5

Watershed Minute

Working at the Car Wash

By Richelle Tolton, SC DHEC

Car washing is common for residents and a popular way for organizations like scout troops, schools, and sports teams to raise funds. In the United States and Canada, there are more than 230 million cars and light trucks, and at one point or another they are all washed. A 1999 survey by the International Carwash Association found that 44.5% of Americans prefer home washing as a method of vehicle care. Furthermore, at least 75% of all cars are washed at home one or more times a year. This adds up to a big impact on water quality.

Each time a car is washed a fine toxic mix is released into the environment. Depending on what is used to wash the vehicle (let's say water alone is the minimum), driveway car-wash discharge consists of oils, grease, elements from brake linings, rust, trace amounts of benzene and possibly chromium, and a few other goodies. Adding soap to the mix possibly introduces phenols, dyes, acids, and ammonia. Imagine what is in spray-off tire cleaner!

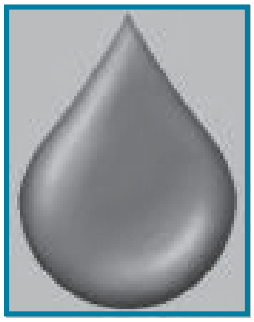
How can you reduce car washing impacts?

- Use only biodegradable soaps.
- Use hoses with nozzles that automatically turn off when left unattended.
- Use a commercial car wash.
- Wash your car on gravel, grass or other permeable surfaces.
- Ideas for charity car washes:
  - 'Rent-a bay for the day' from a commercial car wash facility
  - Block off the storm drain during charity car wash events or using an insert to catch wash water
  - Pump soapy water from car washes into a sanitary sewer drain (not the storm drain).
  - If pumping into a drain is not feasible, pump car wash water onto grass or landscaping to provide filtration.
  - Instead of hosting a car wash, partner with local commercial car washes for coupons to sell as part of a fundraiser

News to Use

EPA's National Pollution Management Measures

EPA's national management measures to control nonpoint source pollution from urban areas is now available. This guidance helps citizens and municipalities in urban areas protect bodies of water from polluted runoff that can result from everyday activities. This publication includes voluntary guidance on 12 management measures designed to prevent and control runoff pollutants from urban and suburban lands.



The management measures cover topics such as watershed assessment and protection; runoff from new and existing development, road networks, and construction sites; septic system impacts; pollution prevention; and inspection and maintenance of urban runoff management practices. This new guidance document is available at www.epa.gov/owow/nps/urbanmm .

Marine Debris Initiative

By Dan Burger, SC DHEC-OCRM

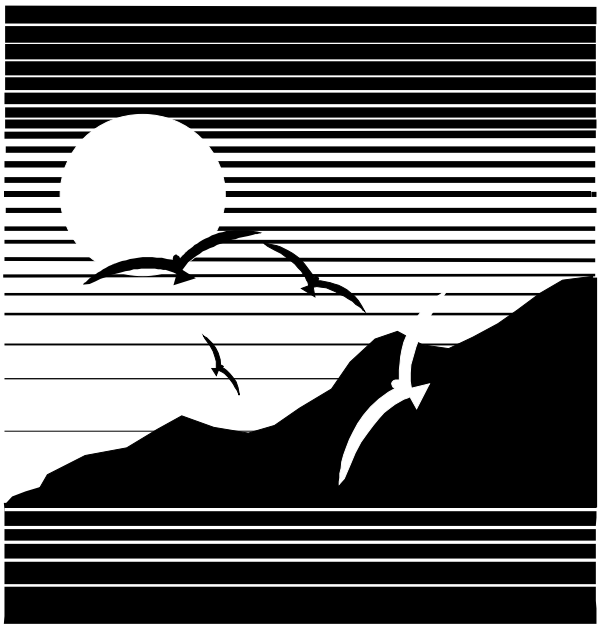
With 2,876 miles of coastal shoreline, South Carolina's coast offers great opportunities for boating, fishing and recreation. Each year, over 1 million residents and 15 million visitors enjoy the life style our coast offers. Unfortunately, not everyone is mindful that their activities can contribute significant amounts of debris to our coastal environment. This is a serious problem that diminishes the beauty of our coast and creates hazards for animals and humans. In fact, over 7 tons of debris were removed in a single day from our beaches last year.

Beyond simply being unattractive, marine debris poses a significant danger to humans and animals. Dolphins, whales and turtles can easily get tangled in fishing gear and it may surprise you what debris can be found in a sea turtle's stomach – anything from plastic bags to styrofoam packing peanuts. Debris that settles on the bottom of the ocean can destroy critical habitat while suspended debris can get wrapped around boat propellers or endanger the lives of recreational divers.

To confront the ongoing threat of marine debris, OCRM is leading a coast-wide initiative to provide a cohesive framework that will help agencies and organizations establish partnerships, leverage resources, educate key populations and reduce the amount of debris entering our coastal environment. The Marine Debris Initiative Plan addresses everything from derelict boats to lost fishing gear to candy wrappers and includes OCRM's existing Abandoned Vessel Removal and Adopt-A-Beach programs.

OCRM will publicly release the plan this summer and will be working with other state agencies, nonprofit and professional organizations on creative marine debris projects that raise public awareness and promote personal responsibility for keeping our coast clean and healthy.

For more information, contact Dan Burger at 843-747-4323 x135 or burgerdj@dhec.sc.gov or visit the Marine Debris Initiative website at www.scdhec.gov/environment/ocrm/outreach/marine_debris.htm.



OCRM's Marine Debris Initiative Plan aims to keep our coast clean and healthy!

Watershed Planning Handbook Helps Protect the Nation's Water Resources

EPA recently released a draft guide to help communities, watershed organizations, and local, state, tribal, and federal environmental agencies develop and implement watershed plans to meet water quality standards and protect water resources. The Handbook for Developing Watershed Plans to Restore and Protect Our Waters (Handbook) offers practical tips and a robust framework to help any and all local or regional watershed planning efforts. The Handbook should be particularly useful to those working to improve and restore impaired or threatened waters.

You can order a free paper copy of the Handbook from the National Service Center for Environmental Publications (NSCEP). Contact NSCEP at 800-490-9198 or by e-mail at ncepimal@one.net, and request EPA document number EPA 841-B-05-005. You may also download a PDF version of the Handbook for free at www.epa.gov/nps/watershed_handbook.

We All Live Downstream

By Kim Asbill, EdVenture Children's Museum

DHEC and the EPA are helping children learn about the environment at a hands-on exhibit at EdVenture Children's Museum in Columbia. The 200-square-foot exhibit, "We All Live Downstream," aims to educate children about preserving our natural resources and environment through a watershed exhibit where visitors can see how contaminants and erosion affect the quality of the water supply. Visitors also learn that everyone lives in a watershed. "Runoff pollution comes from people who do not dispose of things properly, such as pet waste, used oil, trash, leaves and grass clippings," the exhibit says.

"EdVenture has identified environmental science and education as one of its top priorities in the development of our facility," said Catherine Horne, president and CEO. The exhibit is a representation of a river complete with pumped-in moving water. Kids can press the red button and see a rainstorm happen right before their eyes. Kids see the flooding of the waters around houses, bridges, farms, cars and animals and witness the effect of erosion as well as see the contaminants run off into the waterways. Another adjacent exhibit, also sponsored by DHEC and EPA, is a realistic storm drain that allows visitors to see that materials and substances enter storm drains and our waterways without any cleaning or filtering. Through visual graphics, kids can see the inside of a storm drain system and learn where it all goes.

Through these interactive, realistic child-size exhibits, children build self-confidence, increase their decision-making skills and really learn how to think and solve problems related to the environment. The exhibit reaches more than 200,000 adults and children annually and is raising general awareness about NPS pollution and demonstrating strategies that can improve the quality of South Carolina's ecosystems for the future.

EdVenture's exhibits on environmental science are housed in an outdoor courtyard called, "The Great Outdoors." This summer, EdVenture will bring people to this outdoor area for Bubbleloosa, an exciting discovery exhibit that helps children explore the science of bubbles. Bubbleloosa opens May 6 and runs until the end of September.

EdVenture is a non-profit organization that provides the children and families of South Carolina with a world-class learning facility. EdVenture is the largest children's museum in the South, and the 10th largest in the nation. Visit EdVenture online at www.edventure.org.

TMDL Implementation Project

Continued from page 2

Farm was dependent on the rural water system and the creek for its water supply. By strategic placement of the well using the latest geological information through the SC Department of Natural Resources, Mr. Swafford's well came in at a whopping 60+ gallons per minute. Before this, Mr. Swafford had unsuccessfully attempted to drill wells for his water in other areas of the farm.

Alexander Farms is a major poultry producer and supplier of mulch to the local and regional landscape industry. By installing a composter, the farm can now offer compost as a product line. As a result, the farm marketed over 60 tractor-trailer loads of compost last year that moved outside the watershed. The farm has also installed another facility to further compost poultry litter utilizing a forced air system to assist in reducing the odor of the litter, making it more acceptable to the landscape industry as a soil amendment and mulching product.

This project has benefited many producers across the watersheds in ways that they had not imagined - particularly economically. It has also provided for the installation of practices that should greatly reduce the fecal coliform loading of the watersheds. Current data for the stations in these watersheds indicate fecal coliform loading has been reduced. Total cost for BMPs for this project, including 319, EQIP, and match, was nearly $765,000.

There are currently seventeen TMDL implementation projects underway. The outlook for measurable water quality improvements in South Carolina is very bright!

Stormwater on Hilton Head Island

Continued from page 1

minimize tree removal. Although the pump station was more expensive than the original design, the Town received SCDNR Flood Mitigation Assistance Grants for two consecutive years to help pay for it.

To mitigate for the 0.468 acres of altered wetland, one acre of created forested wetland was installed between the lagoon and a natural forested wetland. As stormwater is pumped into the lagoon, sediment falls to the bottom, and native plants and bacteria biodegrade many of the polluting chemicals. The water level rises and water begins to flow through the created wetland, which has both planted and volunteer native plants to further filter the water. From there, the water flows through the natural forested wetland, into the headwaters of Jarvis Creek, and into Jarvis Creek itself.

The Town monitors the quality of the stormwater at the pump station and at its outfall into a ditch in the natural forested wetland. To date, 58% of the samples tested show reduced levels of fecal coliform bacteria at the outfall compared to the pump station. Dissolved oxygen is consistently higher at the outfall, and phosphorus and nitrate are lower at the outfall. The next step includes installation of interpretive signs so that visitors can get ideas on how to apply these concepts in their own communities.

For more information on this project, contact Sally Krebs at sallyk@hiltonheadislandsc.gov.

Coming Events

* 2007 South Carolina Conservation Partnership Conference
January 3-6, 2007
Embassy Suites-Kingston Plantation, Myrtle Beach, SC.
The conference will focus on Watershed Assessment.

* 2nd National Low Impact Development Conference,
March 12-14, 2007,
Wilmington Hilton Riverside,
Wilmington, NC. Go to
www.soil.ncsu.edu/swetc/lid/home.htm

Turning the Tide
Bureau of Water
SC DHEC
2600 Bull Street
Columbia, SC 29201
Editor: Anne Marie Johnson
(803) 898-4187
E-mail: johnsoam@dhec.sc.gov

Return Service Requested